

CLAIMS

What is claimed is:

- Sub H7
1. A transmitter system, comprising:
- 5 a data modulation unit configured to generate a digital stream of pulse data which is synchronized with a master clock;
- a transmitter unit coupled to said data modulation unit, said transmitter unit configured to receive said digital stream of pulse data and generate a radio frequency (RF) pulse stream; and
- 10 an antenna coupled to said transmitter unit, said antenna configured to transmit said RF pulse stream .
- 2, The transmitter system of claim 1, wherein said RF pulse stream is an ultra wide band pulse stream.
- 15 3. The transmitter system of claim 2 wherein said data modulation unit further comprises a pulse amplitude modulation module which is configured to vary the amplitude of said digital stream of pulse data.

4. The transmitter system of claim 2 wherein said data modulation unit further comprises a pulse repetition frequency module which is configured to vary the pulse repetition frequency, of said digital stream of pulse data.

5 5. The transmitter system of claim 3 wherein said data modulation unit further comprises a pulse repetition frequency module operatively coupled to said pulse amplitude modulation module, said pulse repetition frequency module configured to vary the pulse repetition frequency of said digital stream of pulse data.

6 6. The transmitter system of claim 3 wherein said data modulation unit further comprises a transmit module operatively coupled between said pulse repetition frequency module and said pulse amplitude modulation module, said transmit module configured to distinguish between different modulation techniques.

15 7. The transmitter system of claim 6 wherein said transmit module is configured to communicate said digital stream of pulse data to said transmitter unit.

8. The transmitter system of claim 6 wherein said transmitter unit further comprises a pulse generator system operatively coupled to said transmit module, said pulse generator

system configured to generate said ultra wide band pulse stream for transmission by said antenna.

9. The transmitter system of claim 8 wherein said pulse generator system is

5 configured to generate a plurality of pull-up turn-on signals, a plurality of pull-up turn-off signals, a plurality of pull-down turn-on signals, and a plurality of pull-down turn-off signals.

10. The transmitter system of claim 9 wherein said transmitter unit further comprises a  
10 drive system operatively coupled to said pulse generator system and configured to combine said plurality of pull-up turn-on signals, said plurality of pull-up turn-off signals, said plurality of pull-down turn-on signals, and said plurality of pull-down turn-off signals to generate said ultra wide band pulse stream.

15 11. The transmitter system of claim 10 wherein said drive system is operatively coupled to said pulse amplitude modulation module, said pulse amplitude modulation module is configured to generate a desired pulse amplitude for said digital stream of pulse data.

20 12. A transmitter Medium Access Control (MAC) layer comprising:

a clock synchronization unit having a timing device with a clock speed;

at least one frequency divider coupled to said clock synchronization unit, said frequency divider configured to reduce said clock speed to generate a desired pulse repetition frequency;

5 at least one slot allocation unit coupled to said at least one frequency divider; and  
a multiplexer/demultiplexer operatively coupled to said at least one slot allocation unit, said multiplexer/demultiplexer configured to merge a plurality of outgoing signals and configured to distribute a plurality of incoming signals.

10 13. The transmitter MAC layer recited in claim 12, wherein each of said at least one slot allocation unit has a particular pulse repetition frequency.

14. The transmitter MAC layer recited in claim 12, wherein each of said at least one slot allocation unit is configured to support different modulation techniques.

15 15. The transmitter MAC layer recited in claim 12, wherein each of said at least one slot allocation unit is configured to support pulse amplitude modulation.

16. The transmitter MAC layer recited in claim 12, where each of said at least one slot  
20 allocation unit is configured to support on-off keying.

Sub 17. A transmitter system configured to transmit pulse amplitude modulated signals, comprising:

a clock interface configured to generate a clock signal;

5 a pulse generator system, operatively coupled to said clock interface, said pulse generator system configured to shape a plurality of incoming pulses;

a drive system operatively coupled to said pulse generator system, said drive system configured to amplify and combine said plurality of incoming pulses;

a data interface configured to generate a data signal; and

10 a variable gain amplifier operatively coupled to said data interface and operatively coupled to said drive system, said variable gain amplifier configured to provide the appropriate gain to said drive system to obtain a desired amplitude.

18. The transmitter system of claim 17 further comprising a pulse repetition frequency module, said pulse repetition frequency module operatively coupled to said pulse generator system and configured to generate variable pulse repetition frequencies.

19. A transmitter system configured to transmit pulse amplitude modulated signals, comprising:

20 a clock interface configured to generate a clock signal;

a pulse generator system, operatively coupled to said clock interface, said pulse generator system configured to shape a plurality of incoming pulses;

a drive system operatively coupled to said pulse generator system, said drive system configured to amplify and combine said plurality of incoming pulses to generate a plurality of output signals;

a data interface configured to generate a data signal; and

an attenuator operatively coupled to said data interface and operatively coupled to said drive system, said attenuator configured to reduce the amplitude of said plurality of output signals and provide a plurality of modified output signals having a desired amplitude.

20. The transmitter system of claim 19 further comprising a pulse repetition frequency module, said pulse repetition frequency module operatively coupled to said pulse generator system and configured to generate variable pulse repetition frequencies.

21. A transmitter system configured to generate base band signals capable of being modulated using pulse amplitude modulation, comprising:

a data modulation unit configured to generate a digital stream of pulse data which is synchronized with a master clock, said data modulation unit comprising:

a transmit module configured to generate a clock pulse, and

a pulse amplitude modulation module configured to generate a data stream for a desired pulse amplitude;

a transmitter unit coupled to said data modulation unit, said transmitter unit configured to receive said digital stream of pulse data and generate a radio frequency (RF) pulse stream;

an amplitude control system operatively coupled to said transmitter unit and said pulse amplitude modulation module, said amplitude control system configured to generate a modified amplitude of said RF pulse stream; and

an antenna coupled to said transmitter unit, said antenna configured to transmit said modified amplitude of said RF pulse stream .

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